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10/687,929	10/20/2003	Soichi Yamazaki	Q78071	8325

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EXAMINER
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NOTE, JANIS L

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/687,929

Applicant(s)

YAMAZAKI ET AL.

Examiner

Janis L. Dote

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 January 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-15, 17-28 and 30-35 is/are rejected.  
7) ☒ Claim(s) 16 and 29 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/31/05.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

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1. The examiner acknowledges the cancellation of claims 36-61 and the amendment to claim 15 set forth in the amendment filed on Oct. 31, 2005. Claims 1-35 are pending.

The "Amendment to the specification" section in the amendment filed on Jan. 12, 2006, has been entered.

2. The "Amendment to the specification" section in the amendment filed on Oct. 31, 2005, did not comply with 37 CFR 1.121 for the reasons discussed in the Notice of non-compliant amendment mailed on Dec. 28, 2005. Accordingly, that "Amendment to the specification" has not been entered.

3. The objections to the specification set forth in the office action mailed on Jul. 6, 2005, paragraph 1, have been withdrawn in response to the amended paragraphs at page 2, line 1, page 65, line 7, page 102, line 2, page 103, line 24, and the amended paragraph bridging pages 76 and 77 of the specification, set forth in the amendment filed on Jan. 12, 2006.

The objections to claims 36-47 set forth in the office action mailed on Jul. 6, 2005, paragraph 4, have been mooted by the cancellation of claims 36-47 set forth in the amendment filed on Oct. 31, 2005.

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The rejections of claims 48 and 61 under 35 U.S.C. 112, second paragraph, and under 35 U.S.C. 101, set forth in the office action mailed on Jul. 6, 2005, paragraphs 6 and 8, respectively, have been mooted by the cancellation of claims 48 and 61 set forth in the amendment filed on Oct. 31, 2005.

The objections to claims 15 and 49 set forth in the office action mailed on Jul. 6, 2005, paragraph 7, have been withdrawn in response to the amendment to claim 15 and the cancellation of claim 49 set forth in the amendment filed on Oct. 31, 2005.

The rejections of claims 48-61 under 35 U.S.C. 102(e) over US 6,839,537 B2 (Mouri) and of claims 36-48 under 35 U.S.C. 103(a) over WO 02/084408 A1 (Matsumura) combined with other cited prior art, set forth in the office action mailed on Jul. 6, 2005, paragraphs 11-13, respectively, have been mooted by the cancellation of claims 36-61 set forth in the amendment filed on Oct. 31, 2005.

The rejections under 35 U.S.C. 103(a) of claims 1-11, 13-17, 22-26, 28, 30, 31, and 33-35 over Matsumura combined with the other cited prior art, set forth in the office action mailed on Jul. 6, 2005, paragraphs 12-16 and 18, have been withdrawn. Applicants have perfected their claim to foreign priority under 35 U.S.C. 119 for the subject matter recited in instant claims 1-11, 13-17, 22-31, and 33-35. The verified English-

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language translation of the priority document Japanese Patent Application 2002-305188 filed on Oct. 31, 2005, provides antecedent basis as set forth under 35 U.S.C. 112, first paragraph, for the subject matter recited in instant claims 1-11, 13-17, 22-31, and 33-35. Accordingly, Matsumura is no longer prior art with respect to the subject matter recited instant claims 1-11, 13-17, 22-26, 28, 30, 31, and 33-35.

The terminal disclaimer filed on Oct. 31, 2005, disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of US Applications 10/687,966, 10/687,968, and 10/701,372 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Accordingly, the rejections of claims 1-24 and 30-35 under the judicially created doctrine of obviousness-type double patenting over claims 1-65 of copending Application No. 10/687,968, over claims 1-54 of copending Application No. 10/687,966, and over claims 1-96 of copending Application No. 10/701,372, set forth in the office action mailed on Jul. 6, 2005, paragraphs 21-24, have been withdrawn.

The rejections of claims 36-61 under the judicially created doctrine of obviousness-type double patenting over claims 1-65 of copending Application No. 10/687,968, over claims 1-54 of copending Application No. 10/687,966, over claims 1-96 of

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copending Application No. 10/701,372, and over claims 1-8 of U.S. Patent No. 5,839,537 B2 (Mouri), set forth in the office action mailed on Jul. 6, 2005, paragraphs 21-25, have been mooted by the cancellation of claims 36-61 set forth in the amendment filed on Oct. 31, 2005.

4. The indicated allowability of claim 27 is withdrawn in view of the newly discovered reference(s) to US 6,399,264 B1 (Ogata). Rejections based on the newly cited reference(s) follow.

5. The examiner notes that the instant specification, in the paragraph bridging pages 25 and 26, discloses that the index of crystallinity is determined by the equation  $\Delta T = T_{mp} - T_{ms}$ , where  $T_{mp} (^{\circ}C)$  represents "the peak central value of the endothermic peak obtained when a melting point is measured according to differential scanning calorimetry (DSC), and  $T_{ms} (^{\circ}C)$  represents the shoulder peak value of the peak." According to the instant specification, a "smaller value of  $\Delta T$  means higher crystallinity."

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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7. Claims 12 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 02/084408 A1 (Matsumura) combined with US 5,858,596 (Tajima) and US 5,738,964 (Uchida).

US 2004/0132920 A1 (US'920), filed under 35 U.S.C. 371, is the national stage of the WO application of Matsumura, and therefore is presumed to be an accurate English-language translation of the WO application of Matsumura. 35 USC 371(c)(2), 372(b), and 365(c). See US'920, the translation of Matsumura, for cites.

Matsumura discloses a first toner comprising 100 parts by weight of toner particles and 1 part by weight of hydrophobic silica particles. The toner particles comprise 100 parts by weight of a polyester binder resin, 1 part by weight of a charge control agent, and 5 parts by weight of a colorant. The polyester binder resin comprises two components: (1a) 15 parts by weight of a polyester block copolymer; and (2a) 85 parts by weight of a non-crystalline, i.e., amorphous polyester resin. In other words, the weight ratio of the polyester block copolymer (1a) to the amorphous polyester resin (2a) is 15:85, which meets the weight ratio ranges recited in instant claims 19-21. The toner particles have an average particle size of 10  $\mu\text{m}$ . Paragraphs 0309-0312 and Table 7 at page 28, example 19. Matsumura discloses that the binder resin is

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colorless. Table 7, example 19. According to Matsumura, when the block polyester copolymer (1a) and the non-crystalline polyester resin (2a) are compatible, the resultant binder resin is colorless. US'920, paragraph 0139. Thus, the block polyester copolymer (1a) and the non-crystalline polyester resin (2a) are reasonably expected to be "sufficiently soluble with each other" as recited in instant claim 18.

The block polyester copolymer (1a) itself comprises 30 wt% of a crystalline block and 70 wt% of a non-crystalline, i.e., amorphous, block. The crystalline block is obtained by condensation of 120 moles of the aliphatic diol ethylene glycol with 100 moles of terephthalic acid. The crystalline block has a weight average molecular weight of 50,000. The amorphous block is obtained by condensation of 100 moles of dimethyl terephthalic acid with 60 moles of neopentyl glycol, a branched monomer component, and 60 moles of ethylene glycol. The amorphous block has a Mw of 140,000. US'920, Table 7, example 19. Based on the information provided in Table 7, the block copolymer comprises about 54 mole% of the crystalline block, which meets the amount range recited in instant claim 19. The block polyester copolymer meets the block polyester compositional limitations recited in the instant claim 19. The block polyester copolymer (1a) has a Mw of 100,000. The block

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polyester copolymer has a crystal melting point of 238°C. See Table 7, example 19.

The non-crystalline polyester resin (2a) component of the binder resin is obtained by condensation of 95 moles of dimethyl terephthalic acid and 5 moles of dimethyl isophthalate with 60 moles of neopentyl glycol as a branched monomer component and 60 moles of ethylene glycol. US'920, Table 7, example 19. The non-crystalline polyester resin (2a) meets the compositional limitations recited in the instant claim. The non-crystalline polyester resin (2a) has a Mw of 18,000. See Table 7, example 19.

Matsumura discloses that the toner exhibits excellent low temperature fixation performance, high temperature offset resistance, and anti-blocking performance. The toner exhibits satisfactory color development. US'920, paragraph 0016 and Table 7, example 19.

Matsumura does not disclose that the non-crystalline polyester resin (2a) component has a crystallinity lower than that of the block polyester copolymer (1a) as recited in instant claim 1, from which claims 12 and 18-21 depend. Nor does Matsumura disclose that the block polyester copolymer (1a) has a heat of fusion as recited in instant claim 12 or the softening point recited in instant claim 20. However, as

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discussed above, the Matsumura block polyester copolymer (1a) comprises about 54 mole% of a crystalline block and meets the compositional limitations recited in instant claims. The Matsumura non-crystalline polyester resin (2a) component meets the amorphous polyester compositional limitations recited in the instant claims. Accordingly, because the Matsumura block polyester copolymer (1a) and the non-crystalline polyester resin (2a) component meet the compositional limitations recited in the instant claims, it is reasonable to presume that the Matsumura block polyester copolymer (1a) and non-crystalline polyester resin (2a) component have the properties recited in instant claims 1, 12, and 20. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Matsumura does not disclose that the toner in example 19 has an acid value of 8 KOH mg/g or less as recited in instant claim 1, from which claims 12 and 18-21 depend. Nor does Matsumura disclose that non-crystalline polyester resin (2a) component has an acid value of 3 to 15 KOH mg/g as recited in instant claim 21.

However, according to Tajima, it is well known in the toner art that the chargeability of toners usable in the development of electrostatic latent images in electrophotography is an important factor for giving good image quality. "This

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chargeability is variable by temperature and humidity conditions, and hence is susceptible to undergo environmental changes, and chargeability of the toners being increased under low temperature, low humidity conditions, and decreased under high-temperature, high humidity conditions, thereby resulting in the deterioration of the image quality." Tajima, col. 1, lines 14-22. Tajima further discloses that it is well known in the toner art that methods for controlling the acid value of polyester resins to 0 to 10 KOH mg/g "sufficiently prevent the lowering of the chargeability [of the toner] under high-temperature, high-humidity conditions so that the deterioration of the formed images can be prevented." Tajima, col. 2, lines 1-7. Uchida discloses that when the acid value of the toner is 0.1 to 5 KOH mg/g, the "dependence of electrification on temperature and humidity is lowered, and image fogging, toner scattering, lowering of image density, blur in the image can be restrained." Col. 4, lines 43-49.

Accordingly, it would have been obvious for a person having ordinary skill in the art, in view of the teachings of Tajima and Uchida, to adjust, through routine experimentation, the acid value of the block polyester copolymer (1a) and the non-crystalline polyester resin (2a) component in the toner disclosed by Matsumura, such that the toner and the non-

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crystalline polyester resin (2a) component have acid values within the ranges recited in instant claims 1 and 21, respectively, and still have the properties required by Matsumura. That person would have had a reasonable expectation of successfully obtaining a toner that exhibits stable chargeability properties even in high temperature and high humidity conditions, and that provides good toned images with sufficient density.

8. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura combined with Tajima and Uchida, as applied to claim 1, from which claims 12 and 18-21 depend from, above, further combined with US 6,022,661 (Kurose), and US 6,063,537 (Nakamura'537). See US'920, the translation of Matsumura, for cites.

The combined teachings of Matsumura, Tajima, and Uchida render obvious the first toner as described in paragraph 7 above, which is incorporated herein by reference. The toner in example 19 of Matsumura is made by a melt-kneading-pulverization-classification method. US'920, paragraphs 0309-0310.

Matsumura does not disclose that its toner has a roundness as recited in instant claim 32.

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Both Kurose and Nakamura'537 disclose toners having an average degree of roundness of not less than 0.960 and a standard deviation of the degree of roundness of not more than 0.040. Kurose, col. 2, lines 64-67; Nakamura'537, col. 2, lines 55-58. Both the Kurose and the Nakamura'537 average degree of roundness is defined as an average of values calculated by the following formula:

Average degree of roundness = (peripheral length of circle equal to projection area of a particle)/(peripheral length of a particle projection image). Kurose, col. 11, line 55, to col. 12, line 3; Nakamura'537, col. 2, line 65, to col. 3, line 13.

The Kurose and the Nakamura'537 formulas meet the circularity formula recited in instant claim 32. The average degree of roundness of not less than 0.960 overlaps the average degree of circularity range of "0.90 to 0.98" recited in instant claim 32.

According to Nakamura'537, an average degree of roundness less than 0.960, or a standard deviation of the degree of roundness exceeding 0.040, "causes degradation in the transferring properties due to a reduction in the fluidity [of the toner], resulting in image losses." Nakamura'537, col. 2, lines 59-62. Both Kurose and Nakamura'537 disclose that toners

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obtained by a kneading-pulverizing-classification method can be further treated with an instantaneous heating treatment to obtain toners having the average degree of roundness required by Kurose and Nakamura'537. Kurose, col. 10, lines 46-51; Nakamura'537, col. 10, lines 38-46. According to Nakamura'537, the "instantaneous heating treatment controls the toner base particles obtained through the kneading-pulverizing method so as to provide a uniform spherical shape, increases the smoothing properties, and reduces the adhesive stress. This makes it possible to provide a toner which is superior in transferring properties, uniformity in electrical charging, and in image-forming performance. . . Fluidity is excellent, uniformity in electrical charge is improved, and a stable durability is ensured for a long time." Nakamura'537, col. 11, lines 33-40 and 55-57. According to Kurose, the "instantaneous heating-treatment controls the toner base particles obtained through the kneading-pulverizing method so as to provide a uniform spherical shape, reduces fine pores appearing on the surface of the toner, and increases the smoothness. This makes it possible to provide a toner which is superior in uniformity in charging and in image-forming performance . . . achieves a stable image-forming performance for a long time." Kurose, col. 11, lines 20-26 and 30-31.

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It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Kurose and Nakamura'537, to further treat the toner particles in the first toner rendered obvious over the combined teachings of Matsumura, Tajima, and Uchida by the instantaneous heat treatment disclosed by both Kurose and Nakamura'537, such that the resultant toner particles have an average degree of roundness of not less than 0.960 and a standard deviation of degree of roundness of not more than 0.040 as taught by both Kurose and Nakamura'537. That person would have had a reasonable expectation of successfully obtaining toners that have superior transferring properties, uniformity in electrical charging, and image-forming performance, and stable durability for a long time, as taught by Kurose and Nakamura'537.

9. Applicants' arguments filed on Oct. 31, 2005, with respect to the rejections over Matsumura in paragraphs 7 and 8 above have been fully considered but they are not persuasive.

Applicants assert that Matsumura is not prior art because, in their view, they have perfected their claim to foreign priority under 35 U.S.C. 119 to Japanese patent application No. 2002-305188 by filing a verified English-language translation of said document on Oct. 31, 2005.

However, the translation does not provide an adequate written description of the subject matter recited in instant claims 12, 18-21, and 32 as required under 35 U.S.C. 112, first paragraph, for the following reasons:

(1) The translation does not disclose the block polyester heat of fusion value of "3 mJ/mg or greater" (emphasis added) recited in instant claim 12. Rather, the translation discloses that the block polyester heat of fusion is "5 mJ/mg or greater." The translation also teaches the disadvantages of using a block polyester having a heat of fusion of less than 5 mJ/mg. Translation, page 11, line 27, and page 31, lines 17-21.

(2) The translation does not disclose that the block polyester and the amorphous polyester "are almost soluble with each other in which aggregated fine crystalline blocks of the block polyester are dispersed in the form of fine particles" recited in instant claim 18. Applicants have not indicated where in the translation there is antecedent basis for the limitation recited in instant claim 18.

(3) The translation does not disclose the compounding weight ratio range between the block polyester and the amorphous polyester of 5:95 to 20:80 recited in instant claims 19-21. Rather, the translation discloses the compounding weight ratio ranges of 5:95 to 45:55 and 10:90 to 30:70. Translation,

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page 39, lines 8-11. There is no appreciation in the translation for the range of 5:95 to 20:80 recited in instant claims 19-21.

(4) The translation does not disclose the block polyester softening point  $T_{1/2}$  range of 200 to 230°C recited in instant claim 20. Rather, the translation discloses the softening point ranges of 90-160°C and 100 to 150°C. Translation, page 27, line 36.

(5) The translation does not disclose that the amorphous polyester has an acid value in the range of 3 to 15 KOH mg/g as recited in instant claim 21. Applicants have not indicated where in the translation there is antecedent basis for the amorphous polyester acid value range recited in instant claim 21.

(6) The translation does not disclose the toner average roundness value range of 0.90 to 0.98 as recited in instant claim 32. Rather, the translation discloses the toner average roundness value range of 0.91 to 0.98. The translation further discloses the disadvantages of using a toner having an average roundness of less than 0.91. Translation, page 13, line 20, and page 69, line 35, to page 70, line 4.

Thus, applicants have not perfected their claim to foreign priority for the subject matter recited in instant claims 12,

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18-21, and 32. Matsumura remains as prior art with respect to the subject matter recited in instant claims 12, 18-21, and 32. Accordingly, the rejections of claims 12, 18-21, and 32 over Matsumura combined with the cited prior art in paragraphs 7 and 8 above stand.

10. Claims 1-6, 9, 10, 12, 14, 18, 20-23, 31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,795,689 (Matsubara'689), as evidenced by US 4,940,644 (Matsubara'644), combined with Tajima and Uchida.

Matsubara'689 discloses a first toner comprising 100 parts by weight of toner particles and 0.8 parts by weight of hydrophobic silica particles. The toner particles comprise 100 parts by weight of a polyester binder resin, a colorant, 2 parts by weight of a charge control agent, 3 parts by weight of a polypropylene, and 2 parts by weight of a wax. The polyester binder resin comprises three components: (1) 65 parts by weight of non-linear polyester resin A-3; (2) 25 parts crystalline polyester resin B-3; and (3) 10 parts by weight of a block polyester resin C-2. In other words, the weight ratio of the polyester block copolymer C-2 to the non-linear polyester resin A-3 is 10:65, which meets the weight ratio ranges recited in instant claims 4, 20, and 21. The toner particles have a

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volume average particle size of 11.0  $\mu\text{m}$ , which is within the size limitation recited in instant claim 33. Col. 14, line 66, to col. 15, line 15; and toner 3 in Table 4 at col. 17. The amount of the binder resin meets the amount range recited in instant claim 22. The polypropylene and wax components meet the wax limitations recited in instant claims 34 and 35. The hydrophobic silica particles meet the external additive limitations recited in instant claims 23 and 31. According to Matsubara'689, the block polyester copolymer C-2 comprises a segment that is compatible with the crystalline polyester resin B-3 and a segment that is compatible with the non-linear polyester resin A-3. Col. 8, lines 62-66. Thus, the block polyester copolymer C-2 and the non-linear polyester resin A-3 are reasonably expected to be "sufficiently soluble with each other" as recited in instant claim 18.

The block polyester copolymer C-2 itself comprises 30 wt% of crystalline block B-3, polyethylenesuccinate, and 70 wt% of polymer block a-2, polyoxypropylene-bisphenol A/fumarate/terephthalate (molar ratio 2:1:1). The crystalline block B-3 has a weight average molecular weight (MW) of 8,900. The polymer block a-2 has a Mw of 13,300. See col. 8, line 18, and Tables 2 and 3 at col. 18. Based on the information provided in Tables 2 and 3, the block polyester copolymer C-2 comprises

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about 39 mole% of the crystalline block B-3, which meets the amount range recited in instant claim 5. The block polyester copolymer C-2 meets the block polyester compositional limitations recited in instant claims 5, 6, 9, 10, and 14.

The non-linear polyester resin A-3 component of the binder resin is obtained by condensation of 20 moles of terephthalic acid, 30 moles of trimellitic acid, and 50 moles of polyoxypropylene-bisphenol A. Table 1 at col. 18, polyester A-3. The non-linear polyester resin A-3 meets the compositional limitations recited in instant claim 3. Matsubara'689 teaches that the non-linear polyester resin preferably has a MW of not less than 50,000. Col. 5, lines 6-7.

Matsubara'689 does not identify the polymer resin segment a-2 of the block polyester copolymer C-2 and the non-linear polyester resin A-3 as amorphous polyester resins. However, Matsubara'644 teaches the amorphous polymer block c, polyoxypropylene-bisphenol A/fumarate/terephthalate (molar ratio 2:1:1), which has the same composition, weight-average and number-average molecular weights, and glass transition temperature as the Matsubara'689 polymer block a-2. See Matsubara'644, Table 2, amorphous polymer c. Matsubara'689 teaches that the non-linear polyester resin is compatible with the polymer block in the block polyester copolymer and that the

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polymer block is desirably an amorphous polymer segment.

Col. 8, lines 62-66, and col. 9, lines 11-17. Matsubara'689 further teaches that the non-linear polyester can be an amorphous non-linear polyester resin obtained by condensing a dihydric carboxylic acid monomer and a dihydric alcohol monomer with a trihydric carboxylic acid. Col. 5, lines 16-19, and col. 6, lines 3-8. As discussed above, the non-linear polyester resin A-3 component of the binder resin is obtained by condensation of 20 moles of terephthalic acid, 30 moles of trimellitic acid, and 50 moles of polyoxypropylene-bisphenol A, which meets the amorphous non-linear polyester resin disclosure at col. 6, lines 3-8. Thus, based on the factual evidence discussed above, it is reasonable to presume that the Matsubara'689 non-linear polyester resin A-3 and the polymer block a-2 in the block polyester copolymer C-2 are amorphous polyester resins. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Matsubara'689 discloses that the toner exhibits adequate fixability at low temperatures, has excellent anti-blocking characteristics and triboelectric properties, and provides excellent color-tone images. The toner also provides fogless clear images and provides excellent toner images after many runs. Col. 3, lines 35-44, and Table 5 at col. 19, toner 3.

Matsubara'689 does not disclose that the amorphous non-linear polyester resin A-3 has a crystallinity lower than that of the block polyester copolymer C-2 as recited in instant claim 1. Nor does Matsubara'689 disclose that the melting point of the block polyester copolymer C-2 is higher than the softening point of the non-linear polyester resin A-3 as recited in instant claim 2. Nor does Matsubara'689 disclose that the block polyester copolymer C-2 has a heat of fusion as recited in instant claim 12 or the softening point recited in instant claim 20. However, as discussed above, the Matsubara'689 block polyester copolymer C-2 comprises about 39 mole% of a crystalline block and meets the compositional limitations recited in the instant claims. The Matsubara'689 non-linear polyester resin A-3 meets the amorphous polyester compositional limitations recited in the instant claims. Accordingly, because the Matsubara'689 block polyester copolymer C-2 and the non-linear polyester resin A-3 meet the compositional limitations recited in the instant claims, it is reasonable to presume that the Matsubara'689 block polyester copolymer C-2 and non-linear polyester resin A-3 have the properties recited in instant claims 1, 2, 12, and 20. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Matsubara'689 does not disclose that toner 3 has an acid

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value of 8 KOH mg/g or less as recited in instant claim 1. Nor does Matsubara'689 disclose that non-linear polyester resin A-3 has an acid value of 3 to 15 KOH mg/g as recited in instant claim 21.

However, according to Tajima, it is well known in the toner art that methods for controlling the acid value of polyester resins to 0 to 10 KOH mg/g "sufficiently prevent the lowering of the chargeability [of the toner] under high-temperature, high-humidity conditions so that the deterioration of the formed images can be prevented." Uchida discloses that when the acid value of the toner is 0.1 to 5 KOH mg/g, the "dependence of electrification on temperature and humidity is lowered, and image fogging, toner scattering, lowering of image density, blur in the image can be restrained." The discussions of Tajima and Uchida in paragraph 7 above are incorporated herein by reference.

Accordingly, it would have been obvious for a person having ordinary skill in the art, in view of the teachings of Tajima and Uchida, to adjust, through routine experimentation, the acid value of the block polyester copolymer C-3 and the non-linear polyester resin A-3 in the toner disclosed by Matsubara'689, such that the toner and the non-linear polyester resin A-3 component have acid values within the ranges recited in instant

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claims 1 and 21, respectively, and still have the properties required by Matsubara'689. That person would have had a reasonable expectation of successfully obtaining a toner that exhibits stable chargeability properties even in high temperature and high humidity conditions, and that provides good toned images with sufficient density.

11. Claims 1, 2, 4-6, 8, 9, 12, 14, 18, 20-23, 31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida.

Matsubara'689 discloses a second toner comprising 100 parts by weight of toner particles and 0.8 parts by weight of hydrophobic silica particles. The toner particles comprise 100 parts by weight of a polyester binder resin, a colorant, 2 parts by weight of a charge control agent, 3 parts by weight of a polypropylene, and 2 parts by weight of a wax. The polyester binder resin comprises three components: (1) 55 parts by weight of non-linear polyester resin A-3; (2) 35 parts crystalline polyester resin B-6; and (3) 10 parts by weight of a block polyester resin C-6. In other words, the weight ratio of the polyester block copolymer C-6 to the non-linear polyester resin A-3 is 10:55, which meets the weight ratio ranges recited

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in instant claims 4, 20, and 21. The toner particles have a volume average particle size of 11.0  $\mu\text{m}$ , which is within the size limitation recited in instant claim 33. Col. 14, line 66, to col. 15, line 15; and toner 6 in Table 4 at col. 17. The amount of the binder resin meets the amount range recited in instant claim 22. The polypropylene and wax components meet the wax limitations recited in instant claims 34 and 35. The hydrophobic silica particles meet the external additive limitations recited in instant claims 23 and 31. According to Matsubara'689, the block polyester copolymer C-6 comprises a segment that is compatible with the crystalline polyester resin B-6 and a segment that is compatible with the non-linear polyester resin A-3. Col. 8, lines 62-66. Thus, the block polyester copolymer C-6 and the non-linear polyester resin A-3 are reasonably expected to be "sufficiently soluble with each other" as recited in instant claim 18.

The block polyester copolymer C-6 itself comprises 20 wt% of crystalline block B-6, polydecamethyleneterephthalate, and 80 wt% of polymer block a-1, polypropylene isophthalate. The crystalline block B-6 has a weight average molecular weight (MW) of 8,700. The polymer block a-1 has a Mw of 13,400. See col. 8, lines 36-39 and Tables 2 and 3 at col. 18. Based on the information provided in Tables 2 and 3, the polyester block

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copolymer C-6 comprises about 28 mole% of the crystalline block B-6, which meets the amount range recited in instant claim 5. The block polyester copolymer C-6 meets the block polyester compositional limitations recited in instant claims 5, 6, 8, 9, and 14.

The non-linear polyester resin A-3 component of the binder resin is obtained by condensation of 20 moles of terephthalic acid, 30 moles of trimellitic acid, and 50 moles of polyoxypropylene-bisphenol A. Table 1 at col. 18, polyester A-3.

Matsubara'689 does not identify the polymer resin segment a-1 of the block polyester copolymer C-6 and the non-linear polyester resin A-3 as amorphous polyester resins. However, Matsubara'644 teaches the amorphous polymer block a, polypropylene isophthalate, which has the same composition, weight-average and number-average molecular weights, and glass transition temperature as the Matsubara'689 polymer block a-1. See Matsubara'644, Table 2, amorphous polymer a. Matsubara'689 teaches that the non-linear polyester resin is compatible with the polymer block in the block polyester copolymer and that the polymer block is desirably an amorphous polymer segment. Col. 8, lines 62-66, and col. 9, lines 11-17. Matsubara'689 further teaches that the non-linear polyester can be an

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amorphous non-linear polyester resin obtained by condensing a dihydric carboxylic acid monomer and a dihydric alcohol monomer with a trihydric carboxylic acid. Col. 5, lines 16-19, and col. 6, lines 3-8. As discussed above, the non-linear polyester resin A-3 component of the binder resin is obtained by condensation of 20 moles of terephthalic acid, 30 moles of trimellitic acid, and 50 moles of polyoxypropylene-bisphenol A, which meets the amorphous non-linear polyester resin disclosure at col. 6, lines 3-8. Thus, based on the factual evidence discussed above, it is reasonable to presume that the Matsubara'689 non-linear polyester resin A-3 and the polymer block a-1 in the block polyester copolymer C-6 are amorphous polyester resins. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Matsubara'689 discloses that the toner exhibits adequate fixability at low temperatures, has excellent anti-blocking characteristics and triboelectric properties, and provides excellent color-tone images. The toner also provides fogless clear images and provides excellent toner images for many runs. Col. 3, lines 35-44, and Table 5 at col. 19, toner 6.

Matsubara'689 does not disclose that the amorphous non-linear polyester resin A-3 has a crystallinity lower than that of the block polyester copolymer C-6 as recited in instant

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claim 1. Nor does Matsubara'689 disclose that the melting points of the block polyester copolymer C-6 are higher than the softening point of the non-linear polyester resin A-3 as recited in instant claim 2. Nor does Matsubara'689 disclose that the block polyester copolymer C-6 have a heat of fusion as recited in instant claim 12 or the softening point recited in instant claim 20. However, as discussed above, the Matsubara'689 block polyester copolymer C-6 comprises about 28 mole% of a crystalline block and meets the compositional limitations recited in the instant claims. The Matsubara'689 non-linear polyester resin A-3 meets the amorphous polyester compositional limitations recited in the instant claims. Accordingly, because the Matsubara'689 block polyester copolymer C-6 and non-linear polyester resin A-3 meet the compositional limitations recited in the instant claims, it is reasonable to presume that the Matsubara'689 block polyester copolymer C-6 and non-linear polyester resin A-3 have the properties recited in instant claims 1, 2, 12, and 20. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Matsubara'689 does not disclose that toner 6 has an acid value of 8 KOH mg/g or less as recited in instant claim 1. Nor does Matsubara'689 disclose that non-linear polyester resin A-3 has an acid value of 3 to 15 KOH mg/g as recited in instant

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claim 21.

However, according to Tajima, it is well known in the toner art that methods for controlling the acid value of polyester resins to 0 to 10 KOH mg/g "sufficiently prevent the lowering of the chargeability [of the toner] under high-temperature, high-humidity conditions so that the deterioration of the formed images can be prevented." Uchida discloses that when the acid value of the toner is 0.1 to 5 KOH mg/g, the "dependence of electrification on temperature and humidity is lowered, and image fogging, toner scattering, lowering of image density, blur in the image can be restrained." The discussions of Tajima and Uchida in paragraph 7 above are incorporated herein by reference.

Accordingly, it would have been obvious for a person having ordinary skill in the art, in view of the teachings of Tajima and Uchida, to adjust, through routine experimentation, the acid value of the block polyester copolymer C-6 and the non-linear polyester resin A-3 in the toner disclosed by Matsubara'689, such that the toner and the non-linear polyester resin A-3 component have acid values within the ranges recited in instant claims 1 and 21, respectively, and still have the properties required by Matsubara'689. That person would have had a reasonable expectation of successfully obtaining a toner that

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exhibits stable chargeability properties even in high temperature and high humidity conditions, and that provides good toned images with sufficient density.

12. Claims 5-9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, as applied to claim 1 above, further in view of additional teachings in Matsubara'689.

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida render obvious the second toner as described in paragraph 11 above, which is incorporated herein by reference.

Matsubara'689 does not exemplify a toner comprising both the non-linear polyester resin A-3 and a block polyester resin that meets the compositional limitations recited in instant claim 7.

However, Matsubara'689 further teaches that the crystalline polyester resin can equally be the crystalline polyester resin B-1, polyhexamethylene sebacate; and that the block polyester copolymer can equally be the block polyester copolymer C-1. The block polyester copolymer C-1 comprises 20 wt% of crystalline block B-1 and 80 wt% of polymer block a-1,

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polypropylene isophthalate. The crystalline block B-1 has a weight average molecular weight (MW) of 14,000. The polymer block a-1 has a Mw of 13,400. See col. 8, line 23 and Tables 2 and 3 at col. 18. Based on the information provided in Tables 2 and 3, the polyester block copolymer C-1 comprises about 19 mole% of the crystalline block B-1, which meets the amount range recited in instant claim 5. The block polyester copolymer C-1 meets the block polyester compositional limitations recited in instant claims 5-9 and 14. For the reasons discussed in paragraph 11 above, it is reasonable to presume that the Matsubara'689 polymer block a-1 in the block polyester copolymer C-1 is an amorphous polyester resin. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Matsubara'689 does not disclose that the amorphous non-linear polyester resin A-3 has a crystallinity lower than that of the block polyester copolymer C-1 as recited in instant claim 1, from which claims 5-7 and 14 depend from. However, as discussed above, the Matsubara'689 block polyester copolymer C-1 comprises about 19 mole% of a crystalline block and meets the compositional limitations recited in the instant claims. The Matsubara'689 non-linear polyester resin A-3 meets the amorphous polyester compositional limitations recited in the instant claims. Accordingly, because the Matsubara'689 block polyester

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copolymer C-1 and non-linear polyester resin A-3 meet the compositional limitations recited in the instant claims, it is reasonable to presume that the Matsubara'689 block polyester copolymer C-1 and non-linear polyester resin A-3 have the properties recited in instant claim 1. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Matsubara'689, to use the crystalline polyester resin B-1 and the block polyester copolymer C-1 as the crystalline polyester resin and the block polyester copolymer in Matsubara'689 toner 6. That person would have had a reasonable expectation of successfully obtaining a toner having the benefits disclosed by Matsubara'689.

Matsubara'689 does not disclose that its toner has an acid value of 8 KOH mg/g or less as recited in instant claim 1.

However, according to Tajima, it is well known in the toner art that methods for controlling the acid value of polyester resins to 0 to 10 KOH mg/g "sufficiently prevent the lowering of the chargeability [of the toner] under high-temperature, high-humidity conditions so that the deterioration of the formed images can be prevented." Uchida discloses that when the acid value of the toner is 0.1 to 5 KOH mg/g, the "dependence of electrification on temperature and humidity is lowered, and

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image fogging, toner scattering, lowering of image density, blur in the image can be restrained." The discussions of Tajima and Uchida in paragraph 7 above are incorporated herein by reference.

Accordingly, it would have been obvious for a person having ordinary skill in the art, in view of the teachings of Tajima and Uchida, to adjust, through routine experimentation, the acid value of the block polyester copolymer C-1 and the non-linear polyester resin A-3 in the toner rendered obvious over the teachings of Matsubara'689, such that the toner has an acid value within the range recited in the instant claims, and still have the properties required by Matsubara'689. That person would have had a reasonable expectation of successfully obtaining a toner that exhibits stable chargeability properties even in high temperature and high humidity conditions, and that provides good toned images with sufficient density.

13. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, as applied to claim 1 above, further combined with US 6,117,608 (Shimizu), as evidenced by US 6,653,040 B2 (Ohba).

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the first toner as described in paragraph 10 above, which is incorporated herein by reference.

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the second toner as described in paragraph 11 above, which is incorporated herein by reference.

Matsubara'689 does not exemplify a toner comprising an external additive as recited in instant claims 24-26. However, Matsubara'689 does not limit the type of external additive used in its toner. Col. 11, lines 63-68.

Shimizu teaches a non-magnetic mono-component developer comprising toner particles comprising a polyester resin and external additives. The external additives comprise a negatively chargeable silica particles and positively chargeable silica particles when subjecting the silica particles to triboelectric charging with an iron powder. Col. 3, lines 13-17; col. 4, lines 36-40; col. 12, lines 50-56; Table 1 at cols. 12 and 13; and examples 1-4 in Table 2 at col. 14. The positively chargeable inorganic particles associated with the tradename RA200HS, manufactured by Nippon Aerosil Co., Ltd, and associated with the tradename HVK2150, manufactured by Wacker

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Chemical Co., are identified in the toner art as silica particles. See Ohba, col. 12, lines 50-62. According to Shimizu, "good triboelectric chargeability can be maintained" by using a toner comprising the positively chargeable silica particles and negatively chargeable silica particles. Such a toner provides images with little change in image density after repeated use. Col. 2, lines 56-61.

Shimizu does not exemplify positively chargeable silica particles having an average particle size of 30 to 100 nm as recited in instant claim 26. However, Shimizu teaches that either the negatively chargeable silica particles or the positively chargeable silica particles can have an average particle size of 30 nm or more and 100 nm or less, while the remaining particles have a particle size of 20 nm or less. Col. 4, line 63, to col. 5, line 7. The average particle size range of 30 to 100 nm meets the particle size recited in instant claim 26. Shimizu teaches that "[b]y controlling the average primary particle sizes of the positively chargeable or negatively chargeable silica particles to the given ranges, the effects thereof can be well maintained and sufficient free flowability of the toner can be secured." Col. 5, lines 7-12.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Shimizu, to use

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negatively chargeable silica particles having an average particle size of 20 nm or less and positively chargeable silica particles having an average particle size of 30 to 100 nm as taught by Shimizu as the external additive in the first toner and second toner rendered obvious over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida That person would have had a reasonable expectation of successfully obtaining nonmagnetic mono-component developers that have good triboelectric chargeability and sufficient free flowability.

14. Claims 23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, as applied to claim 1 above, further combined with US 6,146,802 (Okada).

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the first toner as described in paragraph 10 above, which is incorporated herein by reference.

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the second toner as described in paragraph 11 above, which is incorporated herein by reference.

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Matsubara'689 does not exemplify a toner comprising an external additive where a ratio of the external additive is liberated from the surface of the toner particles as recited in instant claim 28. However, Matsubara'689 does not limit the type of external additive used in its toner. Col. 11, lines 63-68.

Okada teaches adding external additive particles, such as silica particles, to toner particles such that the external additive particles are attached to the toner particles and are liberated from the toner particles. According to Okada, an "inclination," i.e., a ratio of particle sizes of the external additive particles to the particle sizes of the mother particles, i.e., toner particles, "is approximated by a straight line obtained by approximating distribution of particle sizes of the external additives with respect to the particle sizes of the mother particles by a least-square method is not larger than 0.6." Col. 11, lines 30-44. Okada teaches that such a toner exhibits improved fluidity and electrification characteristics regardless of particle size. Col. 10, lines 65-67. Okada further teaches that it is preferable that the amount of liberated silica particles is 5.0 wt% or less. According to Okada, if the amount of liberated silica is large, the silica will cause silica filming on the development roller,

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the photoconductor, and the intermediate transfer member in an image forming apparatus; and the silica cannot be sufficiently removed by a cleaning blade. Col. 47, lines 23-31. Okada exemplifies adding 2.0 parts by weight of silica particles having an average particle size of 10 nm and 0.7 parts by weight of silica particles having an average particle size of 40 nm to 100 parts by weight of toner particles. The resultant toner exhibited an inclination of 0.541 and the amount of liberated silica was 3.72 wt%. The toner exhibited excellent transfer efficiency. Example 5 at cols. 47 and 48, and Table 48 at col. 48, sample 1.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Okada, to externally add the two sizes of Okada silica particles to the first toner and the second toner rendered obvious over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, as taught by Okada such that the resultant toners have an inclination of not larger than 0.6 and 5 wt% or less of the silica particles are liberated from the toner particles. That person would have had a reasonable expectation of successfully obtaining toners that have improved fluidity and electrification characteristics, and good transfer efficiency.

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15. Claims 23-25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, as applied to claim 1 above, further combined with US 6,399,264 B1 (Ogata).

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the first toner as described in paragraph 10 above, which is incorporated herein by reference.

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the second toner as described in paragraph 11 above, which is incorporated herein by reference.

Matsubara'689 does not exemplify a toner comprising an external additive as recited in instant claims 24, 25, and 27. However, Matsubara'689 does not limit the type of external additive used in its toner. Col. 11, lines 63-68.

Ogata teaches a toner external additive comprising negatively chargeable silica particles, positively chargeable silica particles, and a lubricant. Col. 4, lines 25-27; Table 1 at col. 12, examples 1-7. Ogata teaches that the positively chargeable silica particles can be colloidal silica particles treated with a silane coupling agent comprising an amino group, such as aminopropyltrimethoxysilane. Col. 9, lines 1-13. The

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colloidal silica particles treated with an amino-containing silane coupling agent meet the product-by-process limitation "treating silica gel with a silane coupling agent having an amino group" recited in instant claim 27. According to Ogata, the toner comprising its external additive provides stable high quality images with good image density, without any undesirable toner contamination of the electrophotographic system. Col. 4, lines 11-22.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Shimizu, to use the Ogata toner external additive as the external additive in the first toner and second toner rendered obvious over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida. That person would have had a reasonable expectation of successfully obtaining toners that provide stable high quality images with good image density, without any undesirable toner contamination of the electrophotographic system.

16. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, as applied to claim 23 above, further combined with US 6,864,030 B2 (Shirai).

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Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the first toner as described in paragraph 10 above, which is incorporated herein by reference. As discussed in paragraph 10 above, toner 3 of Matsumura comprises externally added hydrophobic silica particles.

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the second toner as described in paragraph 11 above, which is incorporated herein by reference. As discussed in paragraph 11 above, toner 6 of Matsumura comprises externally added hydrophobic silica particles.

Matsubara'689 does not disclose that the toner particles are coated with the externally added hydrophobic silica as recited in instant claim 30.

Shirai teaches that it is desirable that the coating ratio of the toner with fine inorganic particles, such as hydrophobic silica particles, is from 130-300%, preferably from 150 to 250%. These coating ratios are within the coating ratio range of 100 to 300% recited in instant claim 30. According to Shirai, when the coating ratio is too low, the "storage property" of the toner is lowered. When the coating is too high, the toner "fixing ability is lowered, thereby causing the image fogging."

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Col. 5, lines 50-51 and 56-58, and col. 6, lines 4-9. Thus, the prior art appears to recognize that the coating ratio of fine inorganic particles to toner particles is a result-effective variable. The variation of a result-effective variable is presumably within the skill of the ordinary worker in the art. Shirai further teaches that "the content of the inorganic fine particles is appropriately determined based on the coating ratio of the toner. As one measure, the content is preferably from 0.7 to 5 parts by weight or so . . . based on 100 parts by weight of toner before external addition." Col. 6, lines 32-38. As discussed in paragraphs 10 and 11 above, in toners 3 and 6 of Matsubara'686, the hydrophobic silica particles are added in an amount of 0.8 parts by weight per 100 parts by weight of toner particles.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Shirai, to adjust, through routine experimentation, the amount of the hydrophobic silica particles added to the first toner and the second toner rendered obvious over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, such that the resultant toners have a coating ratio of 130 to 300% as taught by Shirai. That person would have had a reasonable expectation

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of successfully obtaining toners having sufficient storage property and fixing ability to provide images without fog.

17. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida, as applied to claim 1 above, further combined with Kurose and Nakamura'537.

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the first toner as described in paragraph 10 above, which is incorporated herein by reference. Toner 3 in Matsubara'689 is made by a melt-kneading-pulverization-classification method. Col. 15, lines 4-9.

Matsubara'689, as evidenced by Matsubara'644, combined with Tajima, and Uchida renders obvious the second toner as described in paragraph 11 above, which is incorporated herein by reference. Toner 6 in Matsubara'689 is made by a melt-kneading-pulverization-classification method. Col. 15, lines 4-9.

Matsubara'689 does not disclose that its toners have a roundness as recited in instant claim 32.

Both Kurose and Nakamura'537 disclose toners having an average degree of roundness of not less than 0.960 and a standard deviation of the degree of roundness of not more

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than 0.040. The discussions of Kurose and Nakamura'537 in paragraph 8 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Yamada, Kurose, and Nakamura'537, to further treat the toner particles in the first toner and in the second toner rendered obvious over Matsubara'689, as evidenced by Matsubara'644, combined with Tajima and Uchida by the instantaneous heat treatment disclosed by both Kurose and Nakamura'537, such that the resultant toner particles have an average degree of roundness of not less than 0.960 and a standard deviation of degree of roundness of not more than 0.040 as taught by both Kurose and Nakamura'537. That person would have had a reasonable expectation of successfully obtaining toners that have superior transferring properties, uniformity in electrical charging, and image-forming performance, and stable durability for a long time, as taught by Kurose and Nakamura'537.

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the

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examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. The rejections in paragraphs 19-26 infra are provisional obviousness-type double patenting rejections because the conflicting claims have not in fact been patented.

20. Claims 1-6, 8-15, and 17-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 3, 6-10, 20, and 22-26 of copending Application No. 10/474,753 (Application'753) in view of Tajima and Uchida.

Reference claim 23, which depends from reference claim 20, recites a toner comprising a colorant and a resin composition that consists essentially of 70% by weight or more of a non-crystalline polyester resin, i.e., an amorphous polyester resin,

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having a glass transition temperature  $T_g$  of 50 to 80°C and a polyester block copolymer having a weight mean molecular weight of 20,000 to 200,000 and consisting of a crystalline polyester segment having a melting point of 140 to 280°C and a non-crystalline polyester segment, i.e., an amorphous polyester segment, having a  $T_g$  of 30 to 80°C. Reference claim 7, which depends on reference claim 3, recites that the crystalline polyester segment having a melting point of 140 to 280°C is obtained by polymerizing 1,4-cyclohexane dimethanol, ethylene glycol and terephthalic acid, and the non-crystalline polyester segment having a  $T_g$  of 30 to 80°C is obtained by polymerizing terephthalic acid, o-phthalic acid, and neopentyl glycol. Reference claim 9, which depends from reference claim 3, recites that the non-crystalline polyester segment is obtained by polymerizing 20 to 100 mole% of a diol having a branched chain, 80 to 99.9 mole% of terephthalic acid, 20 to 01 mole% of o-phthalic acid or phthalic anhydride. Reference claim 8, which depends from reference claim 3, recites that the polyester block copolymer comprises 1 to 70% by weight of the crystalline polyester segment and 99 to 30% by weight of the non-crystalline polyester segment. The polyester block copolymer recited in Application'753 meets the polyester block copolymer compositional limitations and physical limitations recited in

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instant claims 1, 5, 6, 8-11, 13, 14, and 19. Reference claim 25, which depends on reference claim 20, recites that the non-crystalline polyester segment in the polyester block copolymer and the non-crystalline polyester resin having a Tg of 50 to 80°C each contain at least identical dicarboxylic acid and diol. Thus, the non-crystalline polyester resin having a Tg of 50 to 80°C meets the amorphous polyester compositional limitations recited in instant claims 3, 15, and 17. Reference claim 24, which depends on reference claim 20, recites that the non-crystalline polyester segment in the polyester block copolymer and the non-crystalline polyester resin having a Tg of 50 to 80°C are compatible with each other. Thus, the block polyester copolymer and the non-crystalline polyester resin are reasonably expected to be "sufficiently soluble with each other" as recited in instant claim 18.

Application'753 does not recite that the non-crystalline polyester resin has a crystallinity lower than that of the block polyester copolymer as recited in instant claim 1. Nor does Application'753 recite that the melting point of the block polyester copolymer is higher than the softening point of the non-crystalline polyester resin as recited in instant claim 2. Nor does Application'753 disclose that the block polyester copolymer has a heat of fusion as recited in instant claim 12 or

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the softening point recited in instant claim 20. However, as discussed above, the block polyester copolymer recited in the reference claims of Application'753 meets the compositional limitations recited in instant claims. The non-crystalline polyester resin also meets the amorphous polyester compositional limitations recited in the instant claims. Accordingly, because the block polyester copolymer and the non-crystalline polyester resin recited in the claims of Application'753 meet the compositional limitations recited in the instant claims, it is reasonable to presume that the block polyester copolymer and non-crystalline polyester resin have the properties recited in instant claims 1, 2, 12, and 20. The burden is on applicants to prove otherwise. Fitzgerald, supra.

The claims in Application'966 do not recite that the toner has an acid value of 8 KOH mg/g or less as recited in instant claim 1. Nor do the claims in Application'966 recite that the amorphous polyester has an acid value of 3 to 15 KOH mg/g as recited in instant claim 21.

However, according to Tajima, it is well known in the toner art that methods for controlling the acid value of polyester resins to 0 to 10 KOH mg/g "sufficiently prevent the lowering of the chargeability [of the toner] under high-temperature, high-humidity conditions so that the deterioration of the formed

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images can be prevented." Uchida discloses that when the acid value of the toner is 0.1 to 5 KOH mg/g, the "dependence of electrification on temperature and humidity is lowered and image fogging, toner scattering, lowering of image density, blur in the image can be restrained." The discussions of Tajima and Uchida in paragraph 7 above are incorporated herein by reference.

Accordingly, it would have been obvious for a person having ordinary skill in the art, in view of the subject matter claimed in Application'753 and the teachings of Tajima and Uchida, to adjust, through routine experimentation, the acid values of the block polyester resin and non-crystalline polyester in the toner covered by the claims of Application'753, such that the toner and the non-crystalline polyester have acid values within the ranges recited in instant claims 1 and 21, respectively. That person would have had a reasonable expectation of successfully obtaining a toner that exhibits stable chargeability properties even in high temperature and high humidity conditions.

21. Claims 23-26 and 31 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims over claims 3, 6-10, 20,

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and 22-26 of copending Application'753 in view of Tajima and Uchida, further in view of Shimizu, as evidenced by Ohba.

The subject matter recited in the claims of Application'753 combined with the teachings in Tajima and Uchida renders obvious a toner as described in paragraph 20 above, which is incorporated herein by reference.

The claims of Application'753 do not recite that the toner comprises an external additive as recited in instant claims 23-26 and 31.

Shimizu teaches a non-magnetic mono-component developer comprising toner particles and external additives that comprise a negatively chargeable silica particles and positively chargeable silica particles when subjecting the silica particles to triboelectric charging with an iron powder. The discussions of Shimizu and Ohba in paragraph 13 above are incorporated herein by reference. Shimizu further teaches that the external additive is present in an amount of 1.3 parts by weight per 100 parts by weight of the toner particles. See Table 2 at col. 14, examples 1-4. The amount is within the range of 4 wt% or less recited in instant claim 31.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Shimizu, to use negatively chargeable silica particles having an average

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particle size of 20 nm or less and positively chargeable silica particles having an average particle size of 30 to 100 nm as taught by Shimizu as the external additive in the toner rendered obvious over the subject matter recited in Application'753 combined with teachings of Tajima and Uchida. That person would have had a reasonable expectation of successfully obtaining a nonmagnetic mono-component developer that has good triboelectric chargeability and sufficient free flowability.

22. Claims 23 and 28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims over claims 3, 6-10, 20, and 22-26 of copending Application'753 in view of Tajima and Uchida, further in view of Okada.

The subject matter recited in the claims of Application'753 combined with the teachings in Tajima and Uchida renders obvious a toner as described in paragraph 20 above, which is incorporated herein by reference.

The claims of Application'753 do not recite that the toner comprises an external additive as recited in instant claims 23 and 28.

Okada teaches adding external additive particles, such as silica particles, to toner particles such that the external

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additive particles are attached to the toner particles and are liberated from the toner particles. The discussion of Okada in paragraph 14 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Okada, to externally add the two sizes of Okada silica particles to the toner rendered obvious over the subject matter recited in Application'753 combined with teachings of Tajima and Uchida, as taught by Okada such that the resultant toners have an inclination of not larger than 0.6 and 5 wt% or less of the silica particles are liberated from the toner particles. That person would have had a reasonable expectation of successfully obtaining a toner that has improved fluidity and electrification characteristics, and good transfer efficiency.

23. Claims 23-25 and 27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims over claims 3, 6-10, 20, and 22-26 of copending Application'753 in view of Tajima and Uchida, further in view of Ogata.

The subject matter recited in the claims of Application'753 combined with the teachings in Tajima and Uchida renders obvious

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a toner as described in paragraph 20 above, which is incorporated herein by reference.

The claims of Application'753 do not recite that the toner comprises an external additive as recited in instant claims 23-25 and 28.

Ogata teaches adding an external additive that comprises negatively chargeable silica, positively chargeable silica, and a lubricant. The discussion of Okada in paragraph 15 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to externally add the Ogata toner external additive to the toner rendered obvious over the subject matter recited in Application'753 combined with teachings of Tajima and Uchida. That person would have had a reasonable expectation of successfully obtaining a toner that provides stable high quality images with good image density, without any undesirable toner contamination of the electrophotographic system.

24. Claim 30 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims over claims 3, 6-10, 20, and 22-26 of copending Application'753 in view of Tajima and Uchida, further in view of Shirai.

The subject matter recited in the claims of Application'753 combined with the teachings in Tajima and Uchida renders obvious a toner as described in paragraph 20 above, which is incorporated herein by reference.

The claims of Application'753 do not recite that the toner particles are coated with the externally added hydrophobic silica as recited in instant claim 30.

Shirai teaches that it is desirable that the coating ratio of the toner with fine inorganic particles, such as hydrophobic silica particles, is from 130-300%, preferably from 150 to 250%. The discussion of Shirai in paragraph 16 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Shirai, to add hydrophobic silica particles to the toner rendered obvious over the subject matter recited in Application'753 combined with teachings of Tajima and Uchida, such that the resultant toner has a coating ratio of 130 to 300% as taught by Shirai. That person would have had a reasonable expectation of successfully obtaining a toner having sufficient storage property and fixing ability to provide images without fog.

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25. Claim 32 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims over claims 3, 6-10, 20, and 22-26 of copending Application'753 in view of Tajima and Uchida, further in view of with Kurose and Nakamura'537.

The subject matter recited in the claims of Application'753 combined with the teachings in Tajima and Uchida renders obvious a toner as described in paragraph 20 above, which is incorporated herein by reference.

The claims of Application'753 do not recite that the toner has a roundness as recited in instant claim 32.

Both Kurose and Nakamura'537 disclose toners having an average degree of roundness of not less than 0.960 and a standard deviation of the degree of roundness of not more than 0.040. The discussions of Kurose and Nakamura'537 in paragraph 8 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Yamada, Kurose, and Nakamura'537, to treat the toner particles in the toner rendered obvious over the subject matter recited in Application'753 combined with teachings of Tajima and Uchida, by the instantaneous heat treatment disclosed by both Kurose and Nakamura'537, such that the resultant toner particles have an

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average degree of roundness of not less than 0.960 and a standard deviation of degree of roundness of not more than 0.040 as taught by both Kurose and Nakamura'537. That person would have had a reasonable expectation of successfully obtaining a toner that has superior transferring properties, uniformity in electrical charging, and image-forming performance, and stable durability for a long time, as taught by Kurose and Nakamura'537.

26. Claims 34 and 35 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims over claims 3, 6-10, 20, and 22-26 of copending Application'753 in view of Tajima and Uchida, further in view US 5,707,772 (Akimoto).

The subject matter recited in the claims of Application'753 combined with the teachings in Tajima and Uchida renders obvious a toner as described in paragraph 20 above, which is incorporated herein by reference.

The claims of Application'753 do not recite that the toner comprises a wax as recited in instant claims 34 and 35.

Akimoto teaches a low molecular weight polypropylene wax that has a melting point between 70 and 150°C. Col. 8, line 66, to col. 9, line 5; and, for example, releasing agent 1 in

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Table 1 at col. 12. The polypropylene wax is synthesized in the presence of a metallocene catalyst. Col. 11, lines 52-67.

Akimoto discloses that toners that comprise said polypropylene wax as a releasing agent provide excellent images with excellent storage stability, little off-set, and "slight winding phenomena." See Toner 1 in Tables 2 and 3, and col. 16, lines 17-18. Akimoto teaches that the amount of the propylene wax added to the toner is preferably 0.5 to 5.0 wt%, more preferably 1.0 to 4.0 wt%, based on the weight of the binder resin. Col. 9, lines 19-21. The toner in example 1 comprises about 3.0 wt% of the propylene wax, based on weight of the binder resin, i.e., about 2.6 wt% based on the total weight of the toner. Col. 12, lines 29-49. According to Akimoto, "[w]hen the added amount is too large, the amount of releasing agent existing on the surface of toner, is increased so that fluidity is reduced. On the contrary, when the added amount is too small, the fixing effect cannot be provided." Col. 9, lines 21-25.

It would have been obvious to a person having ordinary skill in the art, in view of the teachings of Akimoto, to incorporate the Akimoto low molecular weight polypropylene wax in an amount that is within the range of 5 wt% or less, e.g., 2.6 wt% based on the weight of the toner, in the toner rendered

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obvious over the subject matter recited in Application'753 combined with teachings of Tajima and Uchida. That person would have had a reasonable expectation of successfully obtaining a toner that provides excellent images with excellent storage stability, little off-set, and "slight winding phenomena," as disclosed by Akimoto.

27. Claims 16 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Mr. Nam Nguyen, can be reached on (571) 272-1342. The central fax phone number is (571) 273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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*Janis L. Dote*  
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GROUP ~~1500~~  
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JLD

Mar. 24, 2006